Combat Terrain Information Systems

Background

The current terrain analysis, topographic, and reproduction support provided by Army Engineer Terrain Teams are slow, labor-intensive processes that do not meet the needs of the Force XXI digital battlefield on which the commander must have the ability to rapidly obtain terrain information and topographic products. CTIS provides digital maps and updates to commanders and weapons platforms in support of mission planning (e.g., Intelligence Preparation of the Battlefield (IPB)), rehearsal (e.g., simulations), and execution (e.g., Common Tactical Picture (CTP)). CTIS also provides automated terrain analysis and visualization, terrain data base development/update/management/distribution, and graphics reproduction.

Capabilities

In order to execute mission requirements, CTIS is developing and fielding a suite of systems consisting of the: Digital Topographic Support System-Heavy (DTSS-H), DTSS-Light (DTSS-L), DTSS-Deployable (DTSS-D), High Volume Map Production (HVMP) equipment, and DTSS-Survey (DTSS-S). These systems are non-major ACAT III programs. In addition to these systems, HQDA directed the acquisition of the DTSS-Base (DTSS-B). CTIS systems are deployed from Brigade through EAC.

Systems

The CTIS Modernization Plan emphasizes the development of a combined, integrated, tactically deployable, fully autonomous terrain analysis and graphics reproduction capability. These capabilities are being provided in 5-ton (DTSS-H) and HMMWV (DTSS-L) configurations. Fielding of the DTSS-H was completed in 1QFY00. The DTSS-H will be replaced by the DTSS-L as part of a HQDA approved technology refreshment program. The DTSS-L is highly mobile and capable of supporting a full range of military operations, as well as peacetime stability and support operations. Both the DTSS-H and DTSS-L have been type classified - standard.

DTSS-D provides a commercial-off-the-shelf (COTS) hardware configuration that is capable of operating all the terrain analysis software. The DTSS-D consists of transportable workstations and peripherals, housed in transit cases, that can be set up to augment the tactical configurations. The DTSS-D does not include tactically deployable shelters and vehicles or tactical communications. The DTSS-D has been type classified - standard. The DTSS-B was procured in response to a USAEUR initiative to develop the capability to generate terrain information over sparsely mapped areas to support training, mission rehearsal, and contingency operations. The DTSS-B was designed to augment capabilities of the National Imagery and Mapping Agency (NIMA) at the EAC level by providing quick response, special purpose mapping, terrain analysis, and data base generation. The DTSS-B has been type classified - standard.

The HVMP is being developed in an effort to modernize the Reproduction Section of the Topographic Support System (TSS). Current high volume graphics reproduction is a time consuming, labor-intensive process. The HVMP will provide a tactical capability to rapidly reproduce large volumes of graphics material including maps, charts, and situation overlays. The HVMP will be capable of reproducing information from hardcopy as well as softcopy via a direct digital interface. The HVMP will interoperate directly, or via the Command Post LAN, with the DTSS and/or other Army Battle Command System (ABCS) to provide the capability to receive and print their digital products.

The DTSS-S is going to be developed as a replacement to the Survey Section of the TSS.

This system's function specifically addresses requirements for geodetic survey support across the battlefield such as geodetic control, airfield surveys, and data collection support to other DTSS configurations. Development and production of this system are not yet scheduled.

Tactical Products

By taking advantage of two powerful commercial software packages, ESRI's ARC/INFO and ERDAS Imagine, the DTSS can generate Tactical Decision Aids (TDAs) from input terrain data. The DTSS provides the user with an easy to use interface to Army standard models to generate a variety of intervisibility and mobility TDAs. Tools are also provided to allow the user to create custom TDAs based on the Area-of-Operation and mission requirements. Image backgrounds can be added to TDAs to provide the user with a more map-like product. Image maps and perspective views can also be created using the stand-alone ERDAS Imagine image processing software. TDAs generated on the DTSS can be output as Map Products for use on other ABCS systems.

The Future

A Pre-Planned Product Improvement (P3I) program will be conducted to address technology insertion and cyclic upgrade of COTS equipment for DTSS as well as modernization initiatives for the TSS. Products developed, as part of the CTIS RDT&E program will be incorporated into all of the DTSS hardware and software architectures. These initiatives include: improved ABCS interoperability; compliance with the Joint Technical Architecture - Army (JTA-A), and Defense Information Infrastructure Common Operating Environment (DII COE); improved data base management and distribution (Map Server); automated feature extraction; improved tactical decision aid functionality; rapid terrain visualization; and improved graphics reproduction.

Additionally, the Army's Topographic Support System (TSS) is outdated and must be modernized to keep pace with Army digitization requirements. Modernization initiatives associated with TSS include updating the Operations, Distribution, and Photomechanical sections with computer workstations, copiers, and printers. The Survey section will be downsized to a HMMWV configuration and the Drafting section will be updated to include digital cartographic equipment.

Program Management

Program management responsibilities and milestone decision authority reside with the Program Executive Office for Command, Control, and Communications Systems (PEO C3S). Project management is provided by the Project Director for CTIS (PD CTIS). The US Army Engineer Research and Development Center (ERDC)/Topographic Engineering Center (USATEC) is the Materiel Developer and PD CTIS is a USATEC member. PD CTIS has management responsibilities for planning, system integration, and execution of assigned products from development through handoff to the Readiness Command. The US Army Engineer School (USAES) is the Combat Developer and the US Army Communications and Electronics Command (CECOM) is the designated Readiness Command.

ERDC POC

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